

Energy-Water Connections in the California Water Plan



January 14, 2005

Integrated Energy Policy Report Workshop

Water Plan Update Status

Update 2004

- January 2005 - Public Review Draft
- Spring 2005 – Final Plan

Update 2008

- Analytical framework currently under development
 - Approach
 - Tools
 - Data
 - Assumptions
 - CALFED coordination
 - Incorporating global climate change considerations into process



Water-Energy Connections in the CWP

- Water Portfolio (Actual Water Use)
- Future Scenarios (Forecasted Water Use)
- Water Management Alternative Analysis



Water Portfolio

- Tracks and records actual water use
- Balances water use with actual water supplied (a.k.a. water budget)
- Data gaps exist in portfolio



Water Portfolio

Coordination Opportunities

- Leverage data collection (including water used for energy production)
- Data can help estimate *current* energy-water relationships
- Narrative describing basic relationships (Update 2004)



Future Scenarios

- Multiple versions of plausible future conditions
- Represent different possible water demand levels in the year 2030
- Varied by key water demand drivers such as population, agricultural activities, etc
- Provide a study basis of future water use and supply



Future Scenarios

Coordination Opportunities

- Develop common future scenario themes and descriptions
- CWP/CEC partnership and pooling of resources to *quantitatively assess future* water-energy relationships



Water Management Alternative Analysis

- Water Management Alternative – A policy or action designed to meet one or more water management objectives such as increase water supply, reduce water use, improve water quality, etc.



Water Management Alternative Analysis

- Estimate costs, benefits, impacts, and other trade-offs that will result from implementing various water management alternatives
- Present results that:
 - answer policy-makers' questions;
 - are standardized across all alternatives;
 - address all significant considerations in analytical process (e.g. energy, environmental, economic, etc)



Water Management Alternative Analysis

- Agricultural lands stewardship
- Agricultural water use efficiency
- Conjunctive management
- Conveyance
- Desalination
- Drinking water treatment and distribution
- Economic incentives (Loans, Grants, and Water Pricing)
- Ecosystem restoration
- Floodplain management
- Groundwater remediation / Aquifer Remediation
- Matching water quality to use
- Other strategies
- Pollution prevention
- Precipitation enhancement
- Recharge area protection
- Recycled municipal water
- Surface storage - CALFED/state
- Surface storage - regional/local
- System reoperation
- Urban land use management
- Urban runoff management
- Urban water use efficiency
- Water transfers
- Water-dependent recreation
- Watershed management



Water Management Alternative Analysis

Coordination Challenge

- Relationships between energy and water can be very complex, reciprocating, counterintuitive and unidentifiable at a high-level
 - All water management alternatives can effect energy
- **More importantly** ...Each water management alternative can create desirable OR undesirable energy impacts depending on many variables such as:
 - Location
 - Operations
 - Specific actions/projects implemented within each alternative
 - Integration with other alternatives



Update 2004 Resource Management Strategies Summary




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Resource Management Strategies	Water Management Objectives								Cumulative Cost of Option by 2030 (\$ Billion)
	Provide Water Supply Benefit	Improve Drought Preparedness	Improve Water Quality	Operational Flex & Efficient	Reduce Flood Impacts	Environmental Benefits	Energy Benefits	Recreational Opportunities	
See narratives for backup									
Demand Reduction									
Agricultural Water Use Efficiency									
Urban Water Use Efficiency									
Operational Efficiency & Redistribution									
Conveyance									
System Reoperation									
Water Transfers									
Supply Augmentation									
Conjunctive Management & Groundwater Storage									
Desalination – Brackish – Seawater									
Precipitation Enhancement									
Recycled Municipal Water									
Surface Storage – CALFED									
Surface Storage – Regional/Local									
Quality Improvement									
Drinking Water Treatment and Distribution									
Groundwater/Aquifer Remediation									
Matching Quality to Use									
Pollution Prevention									
Urban Runoff Management									
Resource Stewardship									
Agricultural Lands Stewardship									
Economic Incentives (Loans, Grants, and Water Pricing)									
Ecosystem Restoration									
Floodplain Management									
Recharge Areas Protection									
Urban Land Use Management									
Water-Dependent Recreation									
Watershed Management									
Other Resource Management Strategies	Objectives vary by strategy (see narratives in remainder of Volume 2)								
The following support activities are essential for successfully integrating packages of these resource management strategies. Compared with the costs of implementing the resource management strategies, the costs are relatively small for the essential support activities shown below (see Chapter 4 of Volume 1).									
Essential Support Activities to Integrate Strategies and Reduce Uncertainty									
Regional Integrated Resource Planning & Management									
Statewide Water Planning									
Data & Tool Improvement									
Research & Development									
Science									

Draft Evaluation Criteria



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Criteria Categories	Criteria
Catastrophic Vulnerability	Drought
	Earthquake
	Flood
	Terrorism/Vandalism
	Toxic Spills
	Wildfire
Economics/Financial	Cost of Unreliability (to Ag, Urban and Environmental Sectors)
	Food Production
	Non-Market Values
	Third Party Impacts
	Water Management Costs
	Willingness and Ability to Pay
 Energy	Production
	Consumption
Institutional and Legal Requirements	Governance
	Implementability
	Regulatory
Natural Resources*	Fisheries
	Groundwater
	Native Habitat/Vegetation
	Water Quality
	Wildlife
Public Trust and Environmental Justice	Benefit/Cost Distribution
	Impact Mitigation
	Planning and Decision-Making Process Transparency and Accessibility
	Stewardship of Public Resources
Recreation	Sport-Fish Populations
	Reservoir-Based (boating, swimming, camping, etc)
	Watercourse-based
Water Management Accomplishments	Agricultural Service Reliability
	Environmental Service Reliability
	Flood Management
	Operational Flexibility
	Utilization of Regional Options
	Urban Service Reliability
	Water Quality Enhancements

Water Management Alternative Analysis

Coordination Opportunities

- Analysis of water-energy relationships
- Cross-resource policy making options
(e.g. water *and* energy incentives to implement management alternatives that provide mutual benefits)



Summary of Coordination Opportunities

Water Portfolio

- Narrative describing basic relationships (Update 2004)
- Water use data can help estimate *current* water-energy relationships
- Leverage data collection for actual water use

Future Scenarios

- Common scenario themes and descriptions
- Quantification of *future* water and energy use

Water Management Alternative Analysis

- Analysis of water-energy relationships
- Explore cross-resource policy-making options

